Attention and Uncertainty about Monetary Policy: Evidence from Corporate and Banks Earnings Calls*

DO NOT CIRCULATE

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Abstract

This paper introduces a novel measure of attention and uncertainty about monetary policy. First, I build a dictionary of bi-grams related to monetary policy based on the TealBooks A. Second, I employ this dictionary to measure monetary policy sentiment and uncertainty using earnings call transcripts from US firms and bank earnings calls since 2001. Aggregate uncertainty about monetary policy in the banking sector is then introduced in Structural vector auto-regression (SVAR). IV evidence suggests that monetary policy uncertainty is an important driver of macro-economic aggregates. The paper reveals that uncertainty about monetary policy in the banking sector predicts drops in industrial production and surges in the credit spread. The findings remain robust to the inclusion of a time trend, a crisis dummy and modifying the dictionary of monetary policy words.

Keywords: Monetary Policy, sentiment analysis, textual analysis

JEL Codes: G21; G30; G40; D83; M1.

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1 Introduction

Monetary policy communication is at the core of the monetary policy toolkit. The effects of monetary policy communication and forward guidance in their FOMC statements have been extensively researched (Handlan, 2020; Hansen and McMahon, 2016; Jarociński and Karadi, 2020). Evidence is unclear on the effect of central bank communication on the economy. Hansen and McMahon (2016) find that shock to forward guidance do not have an impact on real economic activity. In contrast, Handlan (2020) reports that the impact of forward guidance is twice as large as traditional monetary policy shocks when measured using text-shocks based FOMC statements. The evidence is thus largely inconclusive and exclusively focuses on the supply of information given by monetary policy to the public. This paper studies monetary policy in a new way. Instead of looking at the supply of information from the central bank, the paper measures banks' and firms' perceptions about monetary policy directly.

Literature has shown that uncertainty about public policy has an impact on economic activity. Baker et al. (2016) build an index of economic policy uncertainty and find that it predicts drops in economic activity. Recent research has focuses on the role of monetary policy uncertainty in news. Husted et al. (2020) present an index counting economic policy uncertainty bi-grams in big US news papers and document that it foresees a fall in industrial production. While these news-based indexes illustrate the impact of aggregate uncertainty in news, they can only measure how newspapers perceive monetary policy and therefore ignore the role of the public's perception of monetary policy despite its role in the monetary policy transmission. Indeed, recent studies argue that perception of monetary policy impacts its transmission mechanism (Masolo and Monti, 2021). Furthermore, periods of high disagreement about the conduct of monetary policy have implications for monetary policy transmission (Sastry, 2022). Bauer et al. (2023) show that perception about monetary policy changes over time and influences the reaction to interest rate changes. To fully capture the

role of monetary policy uncertainty, a sound empirical approach therefore needs to incorporate the evolution of the perception of monetary policy across time.

The empirical evidence thus far exclusively uses survey data or stock returns to capture perception of monetary policy. Bauer et al. (2023) uses the Blue Chip Financial Forecasts (BCFF) which mainly focuses on banks and might not relate to bank fundamentals. Other studies capture perceptions through the reaction of the stock markets (Gati and Handlan, 2021; Hattori et al., 2016). Combining both, Elenev et al. (2024) report that stock market sensitivities are impacted by the survey of professional forecasters perceptions of monetary policy. Such approaches, however, ignore the perception of real decision-makers in the economy, namely bank and firms' managers. On top of this, using survey assumes that attention to the macro-economic environment by firms is constant whereas it varies with the business cycle (Flynn and Sastry, 2023). This paper contributes to the literature by building an index of monetary policy sentiment and uncertainty at the bank and firm level that allows for change in attention across time.

First, I analyse the evolution of attention to monetary policy. A raw count of the words 'monetary policy' and 'interest rate' reveals that monetary policy is, more than ever, at the center of banks' and firms' managers discussions with analysts. With this in mind, I build a dictionary of monetary policy words by isolating sections of the Tealbooks A based on their titles. When a title refers to monetary policy, the text following the title is extracted to create a dictionary of monetary policy words. Evidence highlights that firms mention these words when they are leveraged and their interest expenses are high relative to their profits. Furthermore, they tend to mention these monetary policy when inflation and employment are high whereas banks' reference to monetary policy words is correlated negatively with inflation.

Second, I build a new proxy of uncertainty about monetary policy based on transcript of conversations between managers and analysts in earnings conference calls. Following Hassan et al. (2019), I compute the sentiment of words appearing 10 words before or after a monetary policy bi-gram and multiply it by a frequency score inflating the sentiment score of rare words. To capture uncertainty at the firm and bank level, I employ Hassan et al. (2021) algorithm and count the occurrence of risk words within 10 words of the monetary policy bi-gram. Third, I compute the cross-sectional average of monetary policy sentiment and uncertainty for banks and firms. I find that bank monetary policy sentiment is procyclical. Bank monetary policy uncertainty seems to peak around shifts in the monetary policy regime, at the end of the forward guidance period for example. This serves as a sense-check and a validation of the bank sentiment indices. In contrast, firm average monetary policy sentiment and uncertainty seems to have little relationship with the business cycle.

Finally, I run a VAR a la Gertler and Karadi (2015) at the quarterly frequency over both the firm and bank sample. Monetary policy is instrumented with high-frequency movements in interest rates from Bauer and Swanson (2022). These movements in interest rates in a 30 minute window around monetary policy announcement are exogenous variations and identify monetary policy surprises. The impulse response functions document how monetary policy uncertainty in the banking sector is a strong predictor of drops in economic activity measured in industrial production. The overshooting after two years points to an impact of monetary policy uncertainty similar to the one in other studies (Bloom, 2009; Baker et al., 2016). The paper also finds that the monetary policy uncertainty shocks tend to increase the credit spread over the next two years, consistent with Husted et al. (2020). Monetary policy sentiment shocks however precedes periods of increased industrial production and lower spread.

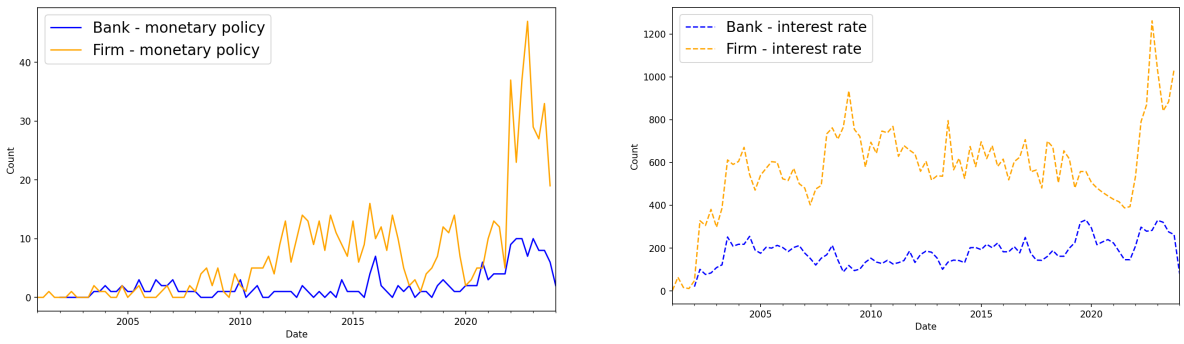
2 The new attention to Monetary Policy

2.1 The return of monetary policy

With the return of high inflation, monetary policy has been at the center of public attention in the last three years. Firms and Banks have always mentioned macro-economic factors in their conversations with managers and analysts. This phenomenon is not novel; empirical evidence suggests that the mention of macroeconomic factors in firms' 10-K documents during times of crisis dates back to the 1990s (Flynn and Sastry, 2023). Figure 1 plots the raw count of mentions of the bi-grams "monetary policy" and "interest rate" and corroborates these results: both firms and banks have paid attention to monetary policy over the last 20 years. Some differences remain: while firms were following monetary policy since the start of the Forward Guidance period in 2011, banks paid particular attention to monetary policy in 2016 when the rates started rising. Panel (b) displays the raw count of the bi-gram "interest rate". Both banks' and firms' attention to "interest rate" is at an all time high, although mentions of the "interest rate" were prevalent during the financial crisis for firms. Overall, the graphs document that attention to monetary policy in the private and banking sector is at an all time high relative to the past two decades.

Figure 1: Mentions of Monetary Policy and Interest rate

(a) (b)



3 A new Index of Sentiment and Uncertainty around Monetary Policy

3.1 Sample construction

The dataset comprises 208,582 earnings calls from US firms[1], along with 10,957 bank earnings calls spanning from Q1 2001 to Q1 2023. These transcripts are sourced from Refinitiv Event Search. Balance sheet information for these firms is from Refinitiv Eikon. By merging these two datasets at the RIC-quarter level, we are able to ascertain the fundamental characteristics of 4949 firms. We merge the bank earnings calls with fundamentals from SNL Financials and obtain fundamentals for 323 banks. To identify the sectors that refer to the real economy, I exclude the sectors of "Finance and Insurance", "Utilities" and "Real Estate and Rental and Leasing" from the sample. Finally, observations with negative assets, sales and market capitalisation are excluded from the sample. The descriptive statistics of banks and firms can be found in the Appendix D and E.

3.2 A dictionary of monetary policy words

The main objective of this paper is to capture the level of optimism and uncertainty about monetary policy of US firms and banks. The main difficulty lies in separating the text referring to monetary policy from parts of the text mentioning the situation of the firm. To address this, I construct a dictionary of terms related to monetary policy. To assemble this dictionary, I download Tealbooks A (formerly known as Greenbooks) from the Federal Reserve website from June 2010 until December 2017. These statements offer several advantages. First, they tend to be focusing on economic matters and employ a specialised vocabulary that reduces noise in the dictionary. Second, they resolve one of the significant challenges in building a monetary policy dictionary. Indeed, central banks often mention

[1]Excluding only the pharmaceutical sector and financial firms not classified as banks

words related to the economy and monetary policy together. So building a dictionary from FOMC statements or Beige books naturally leads to words that refer to both the economy and monetary policy. The Tealbooks A are unique in that they employ headers, with sections covering monetary policy, risks and uncertainties as well as the economy. I take advantage of this natural separation between topics and isolate texts following a title referring to monetary policy from titles referring to economic growth and risks. [2].

Using regular expressions, I extract all the text after a monetary policy title and group it in a monetary policy text. The monetary policy text is then treated as a 'bag-of-words' for which the order of words does not matter. The text has a lot of Tables and numeric characters since the Tealbooks A are used to communicate Central bank forecasts. I therefore start by removing numeric characters and quarters in rows of tables. Then, I remove double white spaced created by this algorithm. Finally, I run all the text through a cleaning algorithm that removes stop words and alpha-numeric characters smaller than two characters.

The text is broken into bi-grams. Using a count-vectorizer yields 25391 bigrams. These bigrams are then simply ranked by absolute frequency. I start by removing bigrams based on their frequency. A bigram is retained in the list if it appears in at least half of the Tealbooks. Since I have 61 Tealbooks, a bi-gram has to appear at least 30 times in the text to be in the list. Next, I select monetary policy bi-grams. If the bi-gram has an ambiguous meaning and could be interpreted differently in another context such as "balance sheet" or "asset price", it is removed. Next, I removed bigrams that appear at least 30 times in the economic words section (following the same algorithm). There is still some noise in the list. I finish by removing bigrams containing the nouns "inflation" and "price". As such, I obtain a list of 101 words referring to monetary policy. I add monetary policy words from (Baker et al., 2016) to make sure synonyms identified in the literature are included in the list. The

[2] An example of the Teal book header structure is given in Appendix A.1 and the full list of titles is presented in Appendix A.2

whole list can be found in Appendix A.

3.3 Monetary policy sentiment and uncertainty

I start by using an algorithm developed by Pastor Y Camarasa and Lamers (2023) to segment the text into sections where managers speak and analysts pose questions, utilizing speaker names and punctuation cues. I separate questions in the Q&A section from answers of CEOs by identifying the name of the speaker. If the speaker is a "Corporate Participants" (CP) representing the bank, the text is an answer. When the "Conference Call Participants" (CCP) speaks, the text is a question. If the name of the speaker is not provided in the transcript, a sentence is identified as a question if it finishes by '?'. The rest of the paper uses the concatenated text of Presentation and Answers to build the analysis.

The paper builds an indicator measuring the sentiment of firms and banks around monetary policy concepts. Instead of conducting simple sentence identification, the algorithm looks at the sentiment of words within a window of 10 words around monetary policy concepts. The monetary policy sentiment of firm i, at quarter t, is given by:

$$MPSent_{i,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \left\{ \left(\sum_{g=b-10}^{b+10} S(g) \right) idf(b) \right\} \tag{1}$$

The construction of the index broadly follows Hassan et al. (2021). The algorithm first identifies a bi-gram b referring to monetary policy from the monetary policy dictionary and then finds the ten words g on the right and the left of the bi-gram b and sums the sentiment of each word $S(g)$. The sentiment score are obtained from Shapiro et al. (2022). The sum of the sentiment scores is then multiplied with the inverse document frequency score $idf(b) = log(\frac{N}{N_b})$. This weighting scheme gives large weight to words that appear only on a given document compared to the total number of documents ($\frac{N_y}{N_b}$ is large when N_b is

low). This reduces the weight of words that appear frequently thus making sure that our $MPSent_{i,t}$ is not dominated by frequent words such as "interest rate" or "interest rates". The final monetary policy sentiment is the average of these weighted sentiment scores.

$$MPUn_{i,t} = \frac{1}{B_{it}} \sum_{b}^{B_{it}} \Big([|b - r| < 10] \Big) \tag{2}$$

The construction of the index is in line with Hassan et al. (2019). As for $MPSent_{i,t}$, the algorithm isolates bi grams b that refer to monetary policy. It then searches for synonyms of risk and uncertainty within 10 words of the monetary policy bi-grams. The risk words are synonyms obtained from the English Oxford Dictionary. The algorithm simply counts the appearance of these risks words associated with monetary policy and normalises by B_{it}, the number of bi-grams in the earnings calls.

3.4 Index validation - Why pay attention to monetary policy?

To validate the index, this section regresses the firm and bank-level index onto their fundamentals. The objective of the exercise is to understand the drivers of monetary policy attention and sentiment between firms and banks as well as to validate the construction of the index with fundamentals. The main regression follows:

$$y_{i,t} = \delta_t + \beta X_{i,t} + \epsilon_{i,t} \tag{3}$$

This simple regression measures the correlation between firm or bank fundamentals with the sentiment or uncertainty of the firm/bank. $y_{i,t}$ is the text-mining variable of interest. $MPAtt_{i,t}$ is an indicator of bank or firm attention counting the number of bi-grams related to monetary policy. $y_{i,t}$ is replaced with the other text indices described in section 3.3. $X_{i,t}$ are firm and bank controls. δ_t is a time fixed effects. Standard errors are clustered at the firm or bank level. The regression is run at the quarterly level. The regression only includes firm fixed effects. This means that the coefficient β in the regression can be interpreted as

a between-effect comparing two banks or firms.

Table 1 depicts a regression analysis of the number of monetary policy bi-grams against firm fundamentals. Firms in 'Finance and Insurance and Real Estate' as well as 'Public Administration firms' are excluding from the sample. In column (2) and (3), we only include firms that mention monetary policy in the earnings calls. Across the board, the table shows that bigger firms in terms of assets pay more attention to monetary policy and express stronger sentiment about it. Firms with a strong profitability generally pay more attention and express a higher sentiment about it. The difference arises when looking at the interest coverage ratio and leverage. When the interest coverage ratio decreases by one standard deviation, monetary policy attention surges by one 100th of a standard deviation. An increase of the same magnitude in leverage raises monetary policy attention by on tenth of the standard deviation and half that size for uncertainty. Attention and uncertainty about monetary policy is thus mainly driven by uncertainty on the liability side of the firms. This means that regardless of profitability, firms which are exposed to interest rate risk because of their balance sheet structure perceive more uncertainty in monetary policy. The results support the idea that firms' mention to monetary policy and monetary policy uncertainty is consistent with their capital structure situation and interest rate risks.

Table 2 is a regression of the number of monetary policy bi-grams on macro-economic fundamentals (including all firms). The main take-away of column (1) and (3) is that firms' mention and worry about monetary policy behave in a similar fashion. This is in line with results by (Flynn and Sastry, 2023) showing that firms pay more attention to economic growth when the economy is in a crisis. Attention is also high in an economy that is experiencing a period of high inflation and rising interest rates. Column (2) shows that monetary policy sentiment is not related to most macro-economic factors. This alludes to the fact that this

Table 1: Relationship between managers' and analysts' sentiment

	(1) $\text{MPAtt}_{f,t}$	(2) $\text{MPSent}_{f,t}$	(3) $\text{MPUn}_{f,t}$
$\log(\text{TA}_{f,t})$	0.168***	0.042***	-0.011
	(0.0105)	(0.00931)	(0.00958)
$\Delta Sales_{f,t}$	-0.005*	0.006	-0.008**
	(0.000146)	(0.000312)	(0.000244)
EBITDA $\text{ratio}_{f,t}$	0.020**	0.021**	0.016*
	(0.00196)	(0.00412)	(0.00350)
$\text{Lev}_{f,t}$	0.099***	0.000	0.040***
	(0.000769)	(0.000613)	(0.000867)
IC $\text{ratio}_{f,t}$	-0.012***	-0.002	-0.004
	(0.0000370)	(0.0000655)	(0.0000506)
Time FEs	Yes	Yes	Yes
Firm FEs	No	No	No
N	129,732	42,760	42,760
R2	0.060	0.008	0.012

This table shows regression of firm managers' sentiment and uncertainty index computed on their earning calls. Firm monetary policy sentiment is the computed looking at the sentiment of 10 words before and after the monetary policy words. The index runs the sentiment algorithm using a sentiment dictionary which combines PMI score from (Shapiro et al., 2020) with Hu and Liu (2004) and Loughran and Mcdonald (2011). Firm monetary policy uncertainty is the computed looking at 10 words before and after the monetary policy words, and counting synonyms of risk words. All controls are winsorized at the first and 99th percentile. Standard errors (in parentheses) are clustered at the firm-level and ***, ** and * refer to significance at the 1%, 5% and 10%.

sentiment likely captures optimism. The positive and significant relationship with CEO confidence further supports this idea. Finally, column (3) documents that uncertainty is high when CEO confidence is low. The results therefore show that monetary policy sentiment and uncertainty are differently linked to the macro-economic environment. While monetary policy attention and uncertainty are related to monetary policy and GDP growth, monetary policy sentiment likely captures optimism at the firm level.

Table 2: Attention of firm Managers to Monetary Policy and Economic Growth

	(1) $\text{MPAtt}_{f,t}$	(2) $\text{MPSent}_{f,t}$	(3) $\text{MPUn}_{f,t}$
Federal Fund rate$_t$	0.0391***	-0.0105*	0.0533***
	(0.00391)	(0.00614)	(0.00760)
inflation$_t(QoQ)$	0.123***	0.0552*	0.0541**
	(0.0135)	(0.0285)	(0.0254)
GDP growth$_t(QoQ)$	-0.0207***	0.00285	-0.0112**
	(0.00209)	(0.00548)	(0.00511)
log(SP500)$_t$	-0.180***	-0.0521	0.000518
	(0.0302)	(0.0472)	(0.0468)
log(emp$_t$)	-0.392*	1.116**	-0.0705
	(0.217)	(0.463)	(0.449)
CEO conf$_t$	-0.00353***	0.00340***	-0.00250***
	(0.000336)	(0.000727)	(0.000665)
Time FEs	No	No	No
Firm FEs	Yes	Yes	Yes
N	161,063	52,113	52,113
R2	0.361	0.177	0.198

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Next, we turn to exploring why banks pay attention to monetary policy. Table 3 conducts the same regression as equation (3) but with banks fundamentals. Column (1) does not shoe any correlation between attention and bank fundamentals. Banks therefore equally pay attention to monetary policy across the distribution. One explanation is that all banks

in the sample are relatively big and listed, which makes them equally pay equal attention to the monetary policy. However, the table shows that sentiment, Return-on-Assets and Provisioning are positively correlated. In other words, banks that have had strong quarters tend to be more optimistic about monetary policy. Banks with a higher risk profile, with a lower equity-to-asset ratio and provisioning, also have more positive sentiment about monetary policy. Finally, what stands out is that banks with high loans-to-deposits and low-equity-to-asset ratios, tend to worry more about monetary policy. These are banks with a lot of asset and a low amount of deposits to fund these assets. These banks would see a dramatic fall in asset value if interest rate were to rises. The worry about monetary policy thus aligns with the interest rate risk at the bank level. The results of Table 3 are consistent with the idea that the sentiment and uncertainty indices are in line with the fundamentals of the bank.

Table 4 presents the correlation between banks attention and macro-economic fundamentals. First, banks pay closer attention to monetary policy when Federal Fund rates are high and the economy is expanding without inflationary pressures. Once again, economic agents tend to pay attention to the economic environment when it affects them. Second, sentiment about monetary policy is elevated in period of low market value and high employment but seems to be only mildly affected by inflation. Finally, the index aligns with measures of monetary policy uncertainty based on news. Monetary policy uncertainty is indeed correlated with the monetary policy index of Husted et al. (2020) at the 1% significance level. This indicates that bank managers are also influenced by news in the media about monetary policy uncertainty. Banks worry about monetary policy when they are in a macro-economic environment with high inflation and GDP growth that is auspicious to a monetary response. Managers attention and perception of monetary policy uncertainty therefore align with the macro-economic environment.

Table 3: Relationship between bank managers' belief about monetary policy and their fundamentals

	(1) $\text{MPAtt}_{b,t}$	(2) $\text{MPSent}_{b,t}$	(3) $\text{MPUn}_{b,t}$
$\log(\text{Size})_{b,t}$	0.101	61.88**	1.777
	(0.0709)	(27.69)	(3.534)
$\text{Eq/TA}_{b,t}$	-0.0220	-31.58***	-3.545***
	(0.0235)	(10.45)	(1.303)
$\text{Loans/dep}_{b,t}$	0.00558	1.065	0.620**
	(0.00373)	(1.943)	(0.246)
$\text{ROA}_{b,t}$	0.0648	101.5**	5.493
	(0.105)	(39.82)	(5.536)
Prov	-0.0543	-63.42***	-4.103**
	(0.0456)	(17.74)	(1.918)
Time FEs	Yes	Yes	Yes
Bank FEs	No	No	No
N	8449	8449	8449
R2	0.0810	0.0661	0.0494

This table shows regression of bank managers' sentiment and uncertainty index computed on their earning calls on their fundamentals. Bank monetary policy sentiment is the computed looking at the sentiment of 10 words before and after the monetary policy words. The index runs the sentiment algorithm using a sentiment dictionary which combines PMI score from (Shapiro et al., 2020) with Hu and Liu (2004) and Loughran and Mcdonald (2011). Bank monetary policy uncertainty is the computed looking at 10 words before and after the monetary policy words, and counting synonyms of risk words. Standard errors (in parentheses) are clustered at the bank-level and ***, ** and * refer to significance at the 1%, 5% and 10%.

Table 4: Attention to Monetary Policy

	(1) $\text{MPAtt}_{b,t}$	(2) $\text{MPSent}_{b,t}$	(3) $\text{MPUn}_{b,t}$
Federal Fund rate$_t$	0.321***	0.672***	2.379**
	(0.0384)	(0.234)	(1.140)
inflation$_t$	-0.498***	0.430*	2.506**
	(0.0434)	(0.242)	(1.216)
GDP growth$_t$	0.0580***	0.0472	2.118***
	(0.0201)	(0.109)	(0.490)
log(SP500)$_t$	1.793***	-5.817***	-24.21***
	(0.277)	(1.203)	(6.333)
log(emp)$_t$	-12.89***	84.90***	-32.86
	(2.790)	(13.25)	(59.83)
Husted et al.(2020)$_t$	0.00423***	-0.00250	0.136***
	(0.000717)	(0.00377)	(0.0166)
Time FEs	No	No	No
Bank FEs	Yes	Yes	Yes
N	10356	10356	10356
R2	0.0572	0.106	0.198

This table shows regression of bank managers' sentiment and uncertainty index computed on their earning calls on macro-economic controls. Bank monetary policy sentiment is the computed looking at the sentiment of 10 words before and after the monetary policy words. The index runs the sentiment algorithm using a sentiment dictionary which combines PMI score from (Shapiro et al., 2020) with Hu and Liu (2004) and Loughran and Mcdonald (2011). Bank monetary policy uncertainty is the computed looking at 10 words before and after the monetary policy words, and counting synonyms of risk words. Standard errors (in parentheses) are clustered at the bank-level and ***, ** and * refer to significance at the 1%, 5% and 10%.

3.5 Business Cycle Behaviour

Figure 2

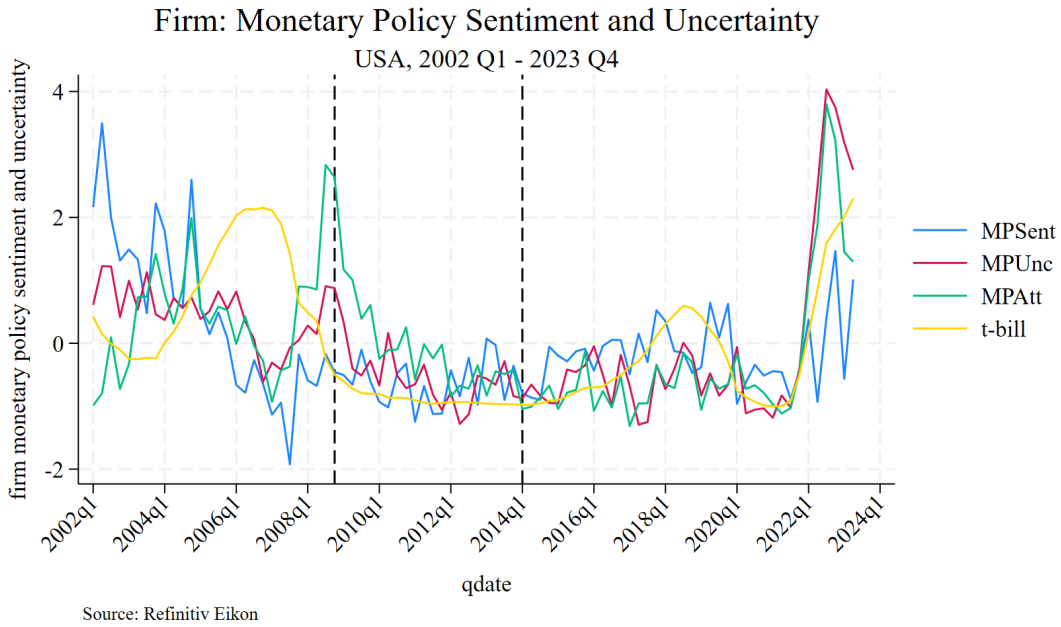
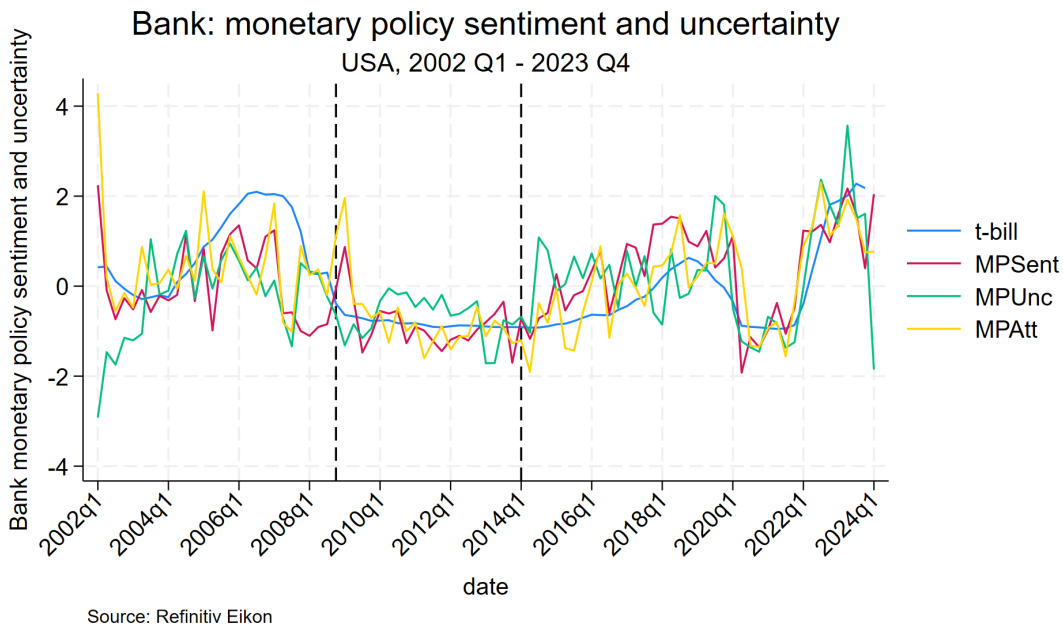


Figure 2 reveals the dynamics of monetary policy sentiment across time for firms in the sample. The graph confirms the existence of attention cycles for monetary policy. Flynn and Sastry (2023) argue that attention to macro-economic fundamentals is generally counter-cyclical. This stylized fact of firm attention indeed holds in our sample. Firms mentioned monetary policy more during the financial crisis and in the last two years, when more inflationary pressures came back. Nonetheless, the attention does not translate into higher sentiment. Firms' monetary policy sentiment does not seem to have interesting business cycle features. Finally, monetary policy uncertainty over the last 10 years seems to peak when the interest rates are high and follow attention. The graph shows a peak of monetary policy uncertainty during the financial crisis and in the last cycle of increasing rates. Monetary policy reaction after the financial crisis seems to have had an impact on monetary policy uncertainty since monetary policy decreases during the Forward Guidance period. Overall, firms sentiment about monetary policy does not vary at the business cycle level while mon-

etary policy uncertainty only peaks during crisis times.

Figure 3



Banks' beliefs about monetary policy are in line with the conduct of monetary policy. The attention of banks to monetary policy peaks during the financial crisis and at the start of the forward-guidance policy. It then subdues during the period of forward guidance (between the two dotted black vertical lines). This means that banks were particularly inattentive to monetary policy when it was communicating the most. At the end of the forward guidance, attention follows the interest rate and slowly increases to peak before the Covid-19 crisis. Sentiment presents a similar pattern as attention. However, there is a small peak before the end of the forward guidance period which might be related to an improvement of macro-economic conditions. Finally, monetary policy uncertainty offers a more interesting business cycle behaviour. While interest rates were high before the financial crisis, monetary policy uncertainty started to decrease before seeing a sharp increase around 2007 and 2008. The start of the forward guidance period in Q4 2008 marks the start of a period of historically low uncertainty around monetary policy. The intense communication of central banks to

the public therefore has managed to calm banks' perception of interest rate risk. The end of Forward Guidance marks the end of a regime of low-for-long and uncertainty suddenly surges when the interest rates start increasing. Around 2019, when interest rates are starting to fall again, the change of dynamics in the fed fund rate goes hand in hand with a large increase in monetary policy uncertainty. Over the last three years, monetary policy uncertainty seems to have followed the reference interest rate. The graph thus shows that uncertainty is high during periods of regime shift where the dynamics of monetary policy is not predictable.

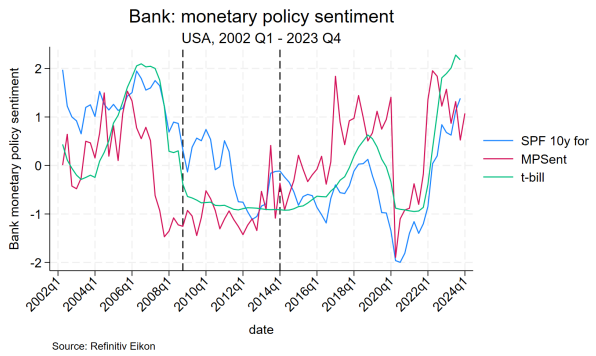


Figure 4: Bank Monetary Policy Sentiment

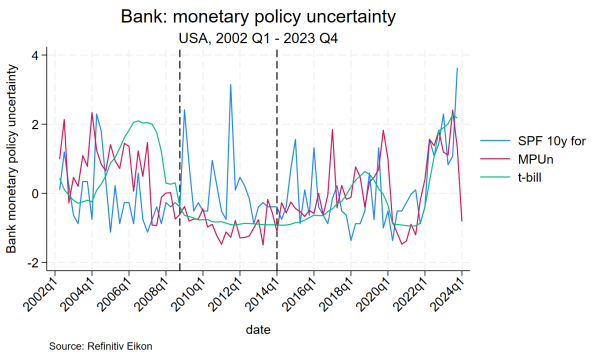


Figure 5: Bank Monetary Policy Uncertainty

Figure 4 and 5 plot the evolution of bank sentiment and uncertainty against the forecast of the Survey of Professional Forecaster. Figure 4 show a strong association between the two series (Correlation of 0.20). Before the Great Financial Crisis, bank monetary policy sentiment seems to move ahead of the median forecast at a 10 year horizon. Bank sentiment starts decreasing in 2006 while the professional forecasters only see a fall in forecasts around 2007. In the COVID crisis, the picture is inverse with bank monetary policy sentiment moving after the professional forecasters. Finally, we can see that the association between bank monetary policy sentiment and the median forecast is stronger since the end of Forward Guidance in 2014. Bank uncertainty about monetary policy is plotted against the inter-quartile range of forecast in Figure 5, a common measure of uncertainty in the literature. There is no strong association before the period of Forward Guidance. During Forward Guidance, monetary

policy uncertainty was low whereas there was some spikes in interest rate uncertainty. Over the last 10 years, bank monetary policy uncertainty and interest rate forecast disagreement are strongly aligned with a correlation of 0.64. There is a new association between bank monetary policy uncertainty and the disagreement in forecast. When thinking about monetary policy uncertainty, the index thus seems to capture uncertainty about the long-term rates.

This section argues that firm monetary policy attention is mainly counter-cyclical and thereby supports the literature. This acts as a sense-check for the construction of the sentiment indices. Second, I find that the dynamics of monetary policy uncertainty in the banking sector is in line with the historical conduct of the policy. Uncertainty is particularly high at the end of the forward guidance period and just before the COVID-19 crisis when rates were elevated.

4 Monetary policy uncertainty and economic activity

4.1 Identification

The main identification is a Vector-Autoregressive-Model a la Gertler and Karadi (2015). To conduct the analysis at the quarterly level, I take the cross-sectional average of the indices at every quarter for both firms and banks. This gives four indices: $BankMPUn_t$, $FirmMPUn_t$, $BankMPSent$ and $FirmMPSent$. The sample runs from Q1 2002 until Q4 2023. The first specification is a Cholesky decomposition to understand how the monetary policy indices built in this paper impacts economic activity and the credit spread. The identification scheme follows a Cholesky decomposition with ordering:

$$e_t = (e_{ip,t}, e_{cpi,t}, e_{BankMPUn,t}, e_{ebp,t}, e_{i,t}) \tag{4}$$

$e_{ip,t}$ is the log of industrial production, $e_{cpi,t}$ is the log of the consumer price index, $e_{BankMPUn,t}$ is any of the four indexes described above and $e_{ebp,t}$ is the excess bond premium, a financial indicator introduced by Gilchrist and Zakrajšek (2012). $e_{i,t}$ is the one year bond, a common proxy for the monetary policy reference rate that is less sensitive to the period of the zero-lower bound. The GZ excess bond premium is the difference between the spread of an index of corporate securities' returns and the safe government bond after controlling for default risk. The VAR has 4 lags and is run at a quarterly level, which gives 88 quarterly observations.

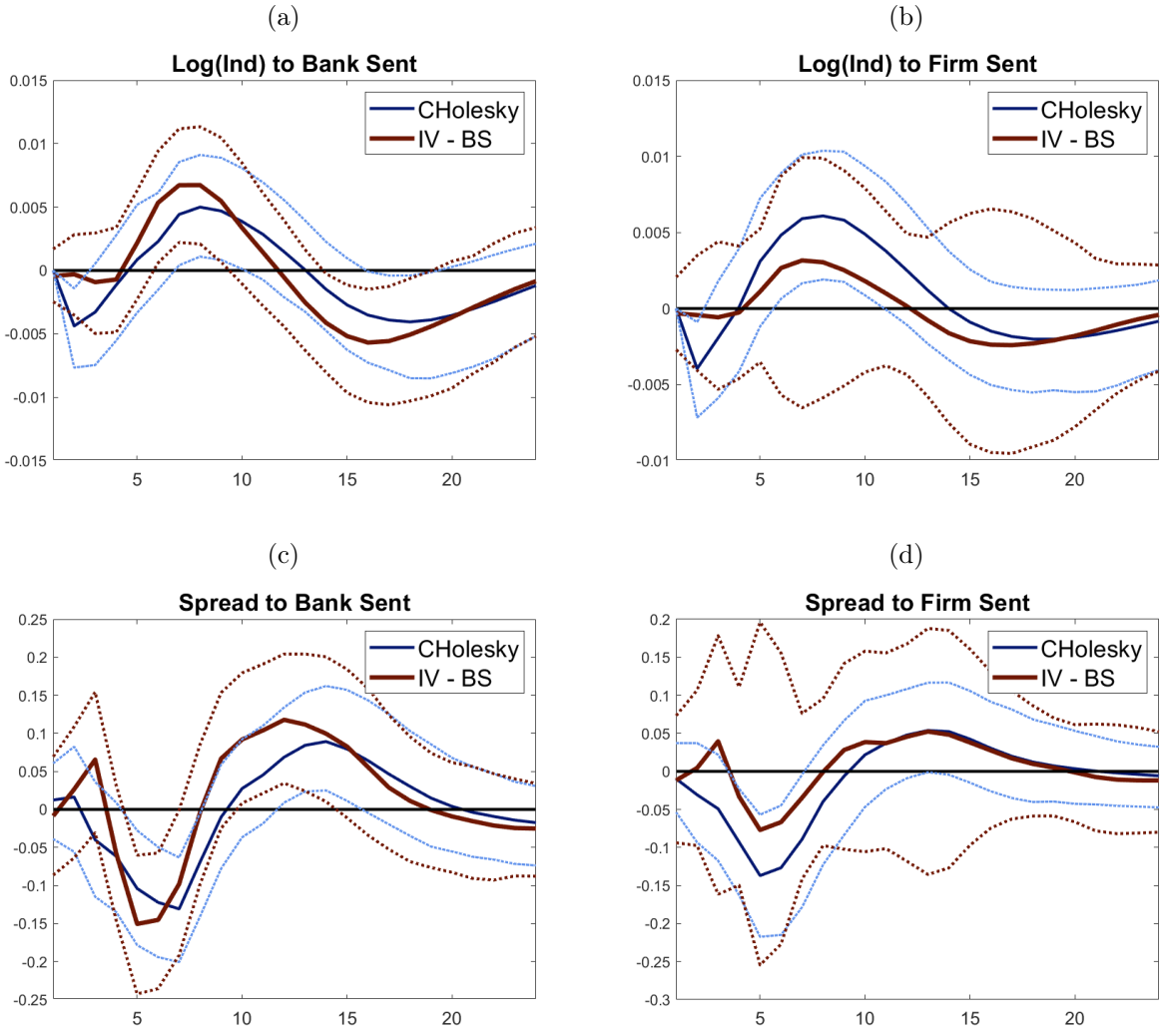
The assumption of the zero contemporaneous impact at the quarterly level is very restrictive. The specification assumes that industrial production at the quarterly level does not impact shocks to monetary policy over the quarter. Similarly, monetary policy uncertainty does not have an impact on the monetary policy interest rate. This is a strong assumption since monetary policy might react in periods of high uncertainty by lowering its interest rate.

To tackle this short-coming, monetary policy uncertainty is instrumented by monetary surprises from Bauer and Swanson (2022). These surprises look at the changes in interest rates around FOMC announcement to identify exogenous variations in interest rates. The assumption is that if interest rates change in a 30 minute window around a FOMC annoucement, the change can be associated with the monetary policy announcement. The Bauer and Swanson (2022) surprises are particularly interesting in that they are orthogonalised with respect to macroeconomic and financial data. The authors regress the first four quarterly Eurodollar futures contracts (ED1-ED4) on predictors of the fed fund rates: $nonfamrpayrolssurprises$, $employmentgrowth$, $SP500$, the Yield curve slope, Commodity prices and the Treasury skewness. The residuals of this regression are then orthogonal changes in monetary policy surprises. This makes sure that the surprises are real unpredictable changes in interest rates and that they are not correlated with macro-economic news. In the following exercise, mon-

etary policy uncertainty is instrumented with this surprises. The impulse response function therefore plot the impact of monetary policy uncertainty that is due to exogenous changes in interest rates.

4.2 The impact of monetary policy sentiment

Figure 6: Sentiment and economic activity: Impulse Response Function



This section describes the reactions of industrial production and the spread to sentiment and uncertainty shocks both with a Cholesky decomposition and a IV specification. Panel (a) and (b) report the response of industrial production after a one standard deviation shock in Monetary Policy uncertainty for both banks and firms. The figure displays the 90% confidence interval and standard errors are computed using bootstrap standard errors. Panel (a) illustrates that industrial production increases after a shock in bank monetary policy sentiment. Most of the effect is concentrated in the first two years after the sentiment shock.

This suggests that positive sentiment about monetary policy takes time to transmit into the private sector and produce real effects. When instrumenting monetary policy sentiment with monetary policy surprises, the effect remains robust. The impact of firm monetary policy sentiment on economic activity has a similar timing and magnitude as bank sentiment. The evidence is nonetheless only suggestive since the effect is not robust to instrumenting monetary policy uncertainty with monetary policy surprises. Panel (c) and (d) documents a stark fall in the credit spread after an increase in monetary policy sentiment followed by an overshoot of the spread. The finding is coherent with the impact on economic activity. Optimism about the conduct of monetary policy allows bank to provide cheaper credit and thus to produce more. Once again the results are not robust for firm monetary policy sentiment. Indeed, section 3.5 highlighted that firm monetary policy sentiment did not have interesting business cycle features. This might explain the lack of robustness of the results for firm monetary policy sentiment.

4.3 The impact of monetary policy uncertainty

Figure 7: Uncertainty and economic activity: Impulse Response Function

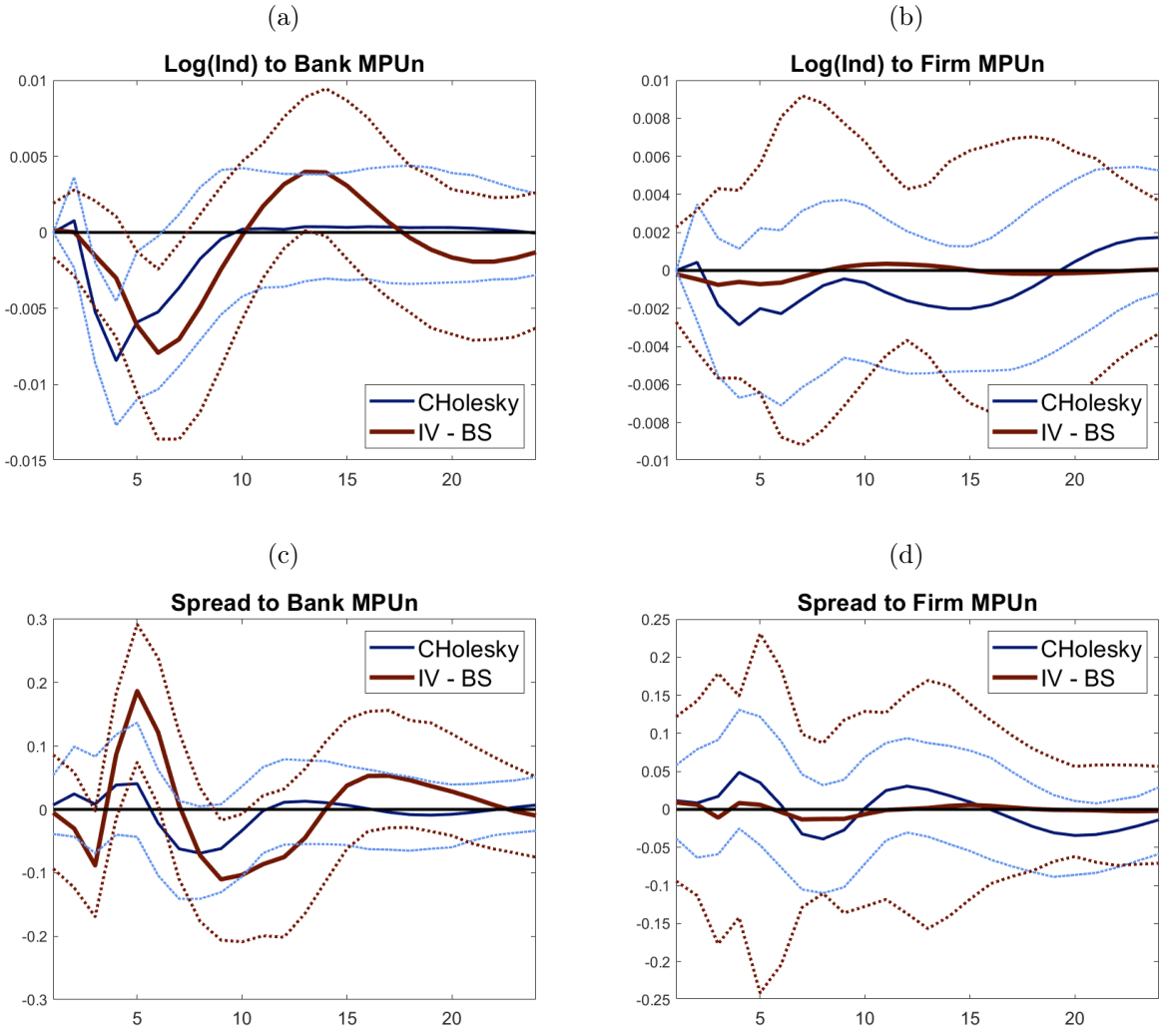
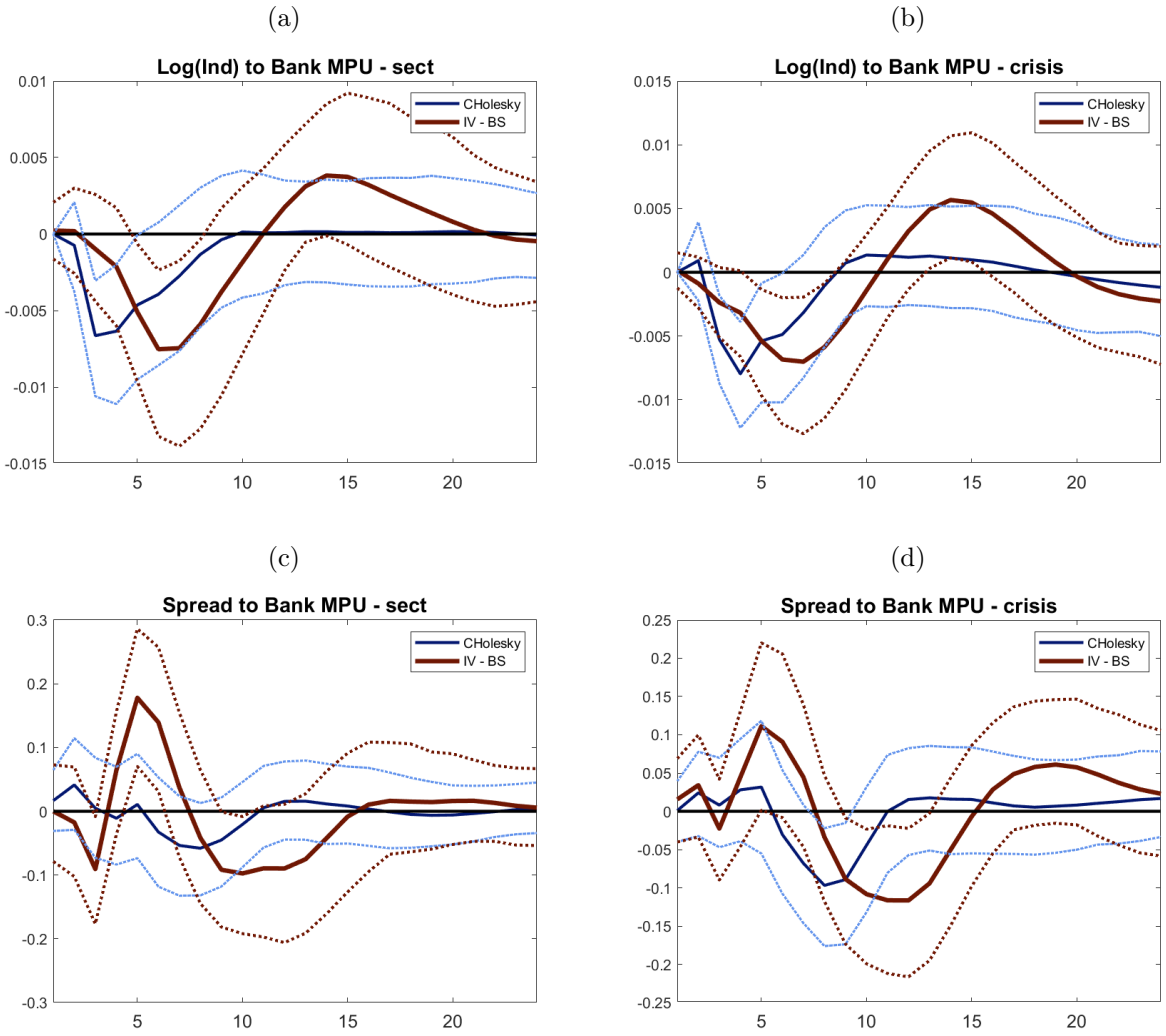


Figure 5 presents the impulse response function to a one standard deviation shock in bank monetary policy uncertainty. Monetary policy uncertainty shocks in the banking sector precedes drops in economic activity measured in industrial production. The impulse response functions in Figure 5 document an effect on monetary policy that comes with a lag. Economic activity is not significantly affected in the short-run. However, between 2 and 10 quarters following the shock, the impact of monetary policy uncertainty on economic activity is negative. We observe a pattern that is commonly found in the uncertainty shock literature: firms suspend their decision at first and then continue to produce when uncertainty is resolved. Since decisions were merely postponed, this creates an excessive demand in factors of production and therefore economic activity overshoots. This pattern is in line with results found in Bloom (2009). The overshoot in the IV specification is therefore a common pattern in uncertainty research. Next, panel (c) and (d) plot the reaction of the spread to a one standard deviation rise in monetary policy uncertainty. While firm monetary policy uncertainty does not have impact on the credit spread, bank monetary policy uncertainty precedes rises in the credit spread in the IV specification. Spikes of monetary policy uncertainty in the banking sector thus leads to a fall in economic in activity due to higher borrowing costs.

This section highlights the implications of monetary policy uncertainty and sentiment for economic activity. The effect of monetary policy uncertainty comes with a lag and only appears within one semester and two years after the occurrence of the shock. In some instances, the VAR also reveals the existence of an overshooting of economic activity, which is consistent with a wait-and-see explanation of the impact of monetary policy uncertainty.

5 Robustness

Figure 8: Uncertainty and economic activity: Impulse Response Function



In this section, I conduct two robustness tests to the main results of the paper. In panel (a) and (c), I remove the monetary policy words from Baker et al. (2016) and only use the words from the dictionary using the Tealbooks A. The results see a fall in economic activity but the effect is smaller than in the baseline regression. This might capture the relevance of words in the Baker et al. (2016) dictionary. Indeed, bi-grams such as "interest rates" and "the fed" are recurrent. Hence, excluding these relevant bi-grams prevents us from capturing the extent of monetary policy uncertainty. The effect on the credit spread remain

nonetheless unchanged. Next, the specification follows Husted et al. (2020) and includes a dummy between 2008 Q2 and 2015 Q4 to control for extreme movements in the external bond premium $e_{ebp,t}$ for the period of the zero-lower bound. The results are highly robust to introducing this crisis dummy.

6 Bank-level evidence - The role of bank sentiment and uncertainty around monetary policy

In this section, I conduct a simple exercise to understand how the slow down in production due to monetary policy uncertainty in the banking sector affects the profitability and the degree of morosity of banks. With the following regression:

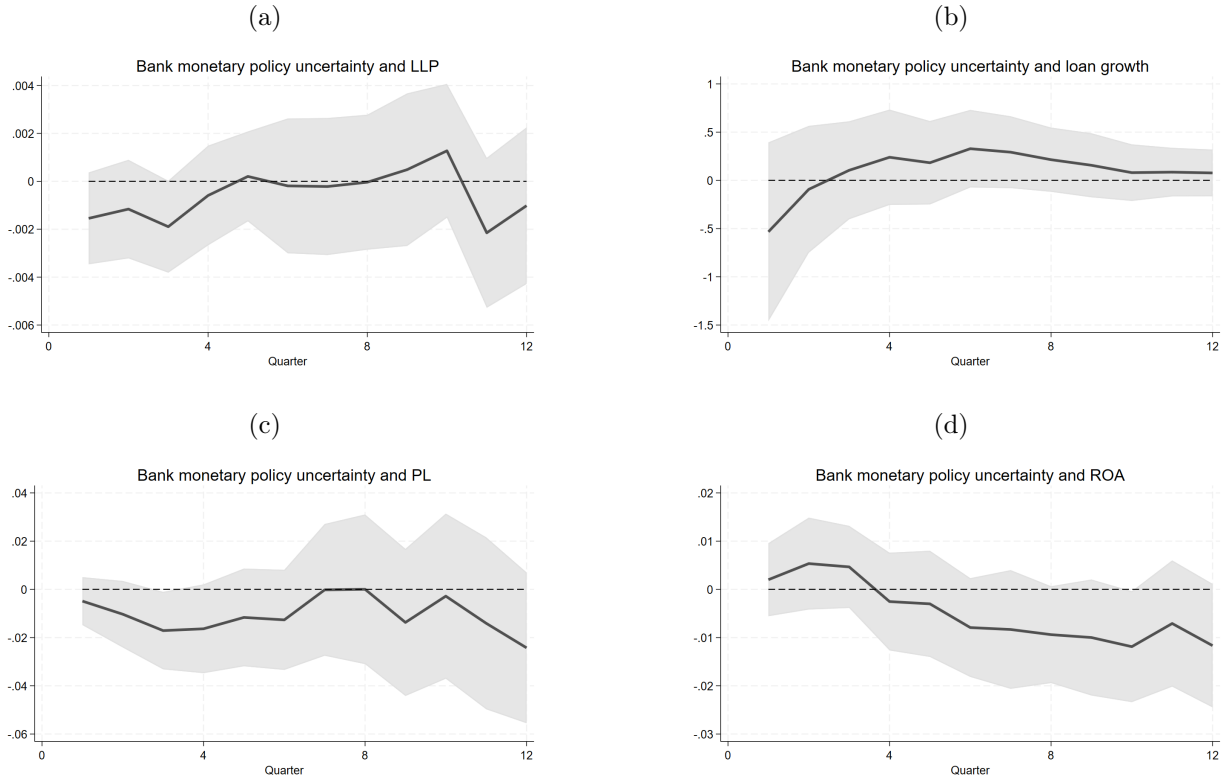
$$y_{b,t+h} = \alpha_i + \delta_t + y_{b,t-1} + \beta_1 MPSent_{b,t} + X_{b,t-1} + \epsilon_{b,t} \tag{5}$$

y is the dependent variable which is either $\Delta loan_{b,t}$ (annualized loan growth), $Loan - loss - provisions_{b,t}$ over $Total - assets$, $Returnonassets_{b,t}$ or $PL = \frac{ProblemLoans}{TotalNetloans}$. a_i are a bank fixed effect and δ_t is a time fixed-effect. $X_{b,t-1}$ are bank controls lagged one quarter including $log(TA)_{b,t}$, $\frac{equity_{b,t}}{TA}$, $cost - to - income_{b,t}$, and $returns_{b,t}$. All variables are the bank-quarter level are winzorized at the 5% and 95% level. Standard errors are clustered at the bank-quarter level.

Figure 7 reports the impact of a one standard deviation shock in monetary policy uncertainty on bank fundamentals. Some movements in fundamentals are consistent with the aggregate evidence in section 4.3. Panel (d) shows a constant fall of ROA after a monetary policy shock at the bank-level but the impact is only significant in the long-run. Loan growth seems to fall on impact before recovering, which is in line with the fall in industrial production in the next two years following the aggregate bank uncertainty shock. This alludes to the fact that the negative impact of monetary policy sentiment on industrial production is due to a credit shortage in the short-run on top of a higher credit spread. ROA then suffers from this slow-down in production. The results are nonetheless not significant at the 90 %. Hence, bank fundamentals and their perception of monetary policy uncertainty are mostly unrelated.

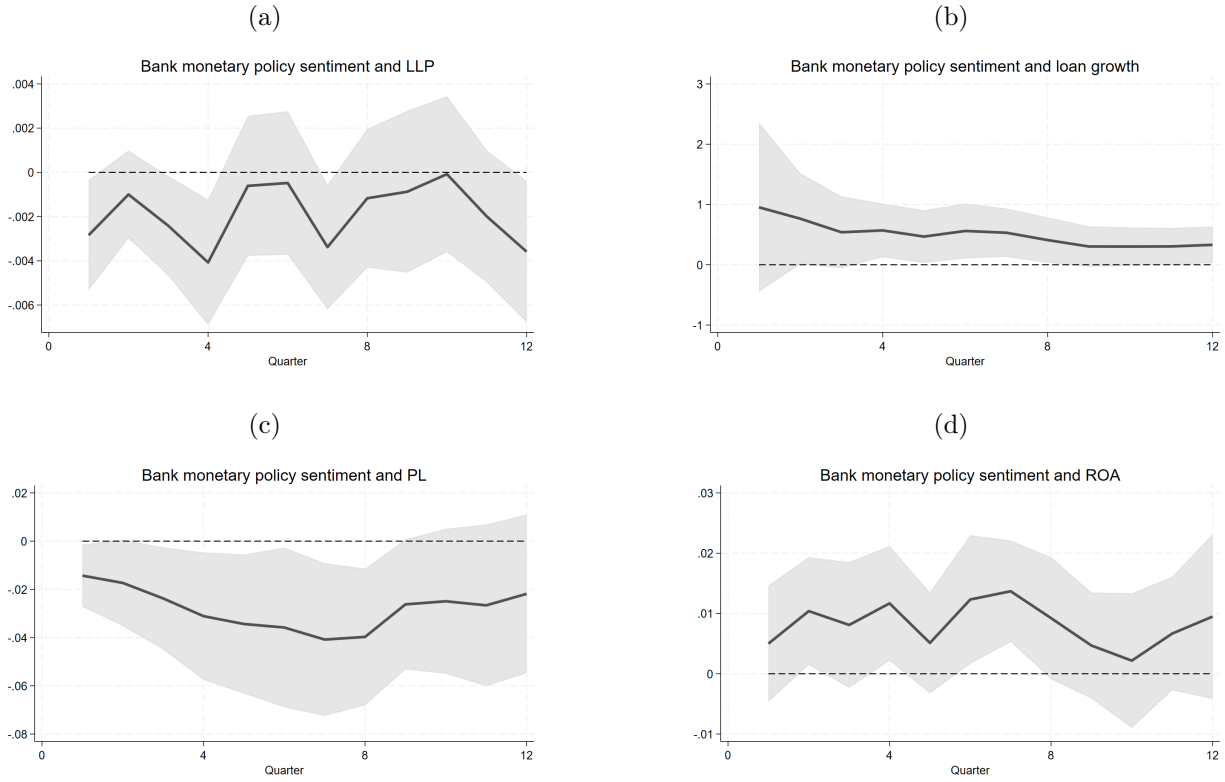
Figure 8 presents the dynamics of banks' lending behaviour after a positive monetary policy sentiment shock. The evolution of bank lending after a positive sentiment shocks are broadly in line with the aggregate evidence in the VAR. After a positive monetary policy sentiment shock, banks' loan growth accelerates over the next two years. This is accompanied with a fall in problem loans and a higher return-on-assets. These findings give a channel of transmission between monetary policy sentiment and industrial production. Monetary policy sentiment shocks are followed by an expansion of credit and lower spreads. The availability of credit supports the rise of economic activity in the private sector. Another take away from Figure 8 is that this expansion of credit and economic activity does not seem to be exuberant. Banks do not have to provision more for credit losses over the next three years. Overall, monetary policy sentiment shocks seem to drive economic activity by an expansion of credit. The economic dynamism following these shocks then benefit the banks by driving their ROA upwards and lowering the amount of problem loans in their balance sheet.

Figure 9: Uncertainty and bank fundamentals



This figure presents local projections a la Jordà (2005). Across the specification, we regress the banks' balance sheet decisions up to 12 quarters ahead on the same controls of equation (5). The impulse response functions show the reaction of n quarter ahead of the variable of interest to a one standard deviation in monetary policy sentiment shock with 90% confidence bands. Standard errors are clustered at the bank-quarter level.

Figure 10: Sentiment and Banks' Fundamentals



This figure presents local projections a la Jordà (2005). Across the specification, we regress the banks' balance sheet decisions up to 12 quarters ahead on the same controls of equation (5). The impulse response functions show the reaction of n quarter ahead of the variable of interest to a one standard deviation in monetary policy uncertainty shock with 90% confidence bands. Standard errors are clustered at the bank-quarter level.

7 Uncertainty and monetary policy transmission

7.1 Empirical strategy

In this section, we explore how monetary policy uncertainty and sentiment impacts the transmission of monetary policy to the real economy. The objective is to understand whether banks and firms with more optimism or perceiving more uncertainty about monetary policy overreact to monetary policy shocks. We start by replicating Cloyne et al. (2023) but using Bauer and Swanson (2022) high-frequency surprises instead of the Gertler and Karadi (2015) surprises. As such, the paper is not only able to identify the impact of beliefs about monetary policy but also how these beliefs might impair the conduct of monetary policy.

The identification of monetary policy shocks remain a challenge in empirical macroeconomics. The identification strategy resides in constructing monetary-policy shocks that are orthogonal to other macro-economic factors. Using the same surprises as in section 4.1, I run a proxy-SVAR with external instrument a la Mertens and Ravn (2013) and Stock and Watson (2018) applied to monetary policy. The SVAR follows closely Gertler and Karadi (2015) specification and has been recently used in Cloyne et al. (2023) to extract macroeconomic shocks. The main idea is to use variations in options of interest rations happening in a short-window around the monetary policy decisions. The assumption is then that these variations are only due to the announcement since nothing else significant occurs in this timelapse. By using these high-frequency variations in a SVAR, I am able to extract structural monetary policy shocks that are orthogonal to macro-economic variables by construction. Data on high-frequency surprises are available from the 90s until 2019q4 in Bauer and Swanson (2022) surprises whereas our sentiment data is available from 2001 Q1 until 2023 Q4. The SVAR approach of Mertens and Ravn (2013) and Stock and Watson (2018) does not require the instrument and the macro-econonomic variables used in the SVAR to overlap, we can therefore obtain monetary policy shocks over the whole periods. The VAR includes a

proxy of interest rates, the log of industrial production, the log of the consumer prices index, the one year interest rate, the external bond premium and the Gilchrist and Zakrajšek (2012) credit spread [3]. The implied monetary policy shocks are then extracted from the VAR. Since they are purged from macro-economic fluctuations, additional macro-economic controls are not necessary in the local-projections.

The estimation of the dynamic causal impact of monetary policy shocks on investment is computed using Local-Projections with Instrument Variables in line with Jordà et al. (2020). In this approach, we use the monetary policy shocks to instrument interest rate changes, and this for two reasons. First, the instrumentation strategy naturally imposes a scale on the variable of interest, here the interest rate change. Second, generated instruments do not share the inference issues of generated regressions as argued by Cloyne et al. (2023). With this in mind, the benchmark specification estimates the impact of monetary policy shocks with an IV specification for h steps ahead:

$$\Delta y_{i,t+h} = \gamma_i + \Sigma_{g=1}^{G} \beta_g^h I[sent_{i,t} \in g].\Delta R_t + \alpha R_{t-1} \epsilon_{i,t+h} \tag{6}$$

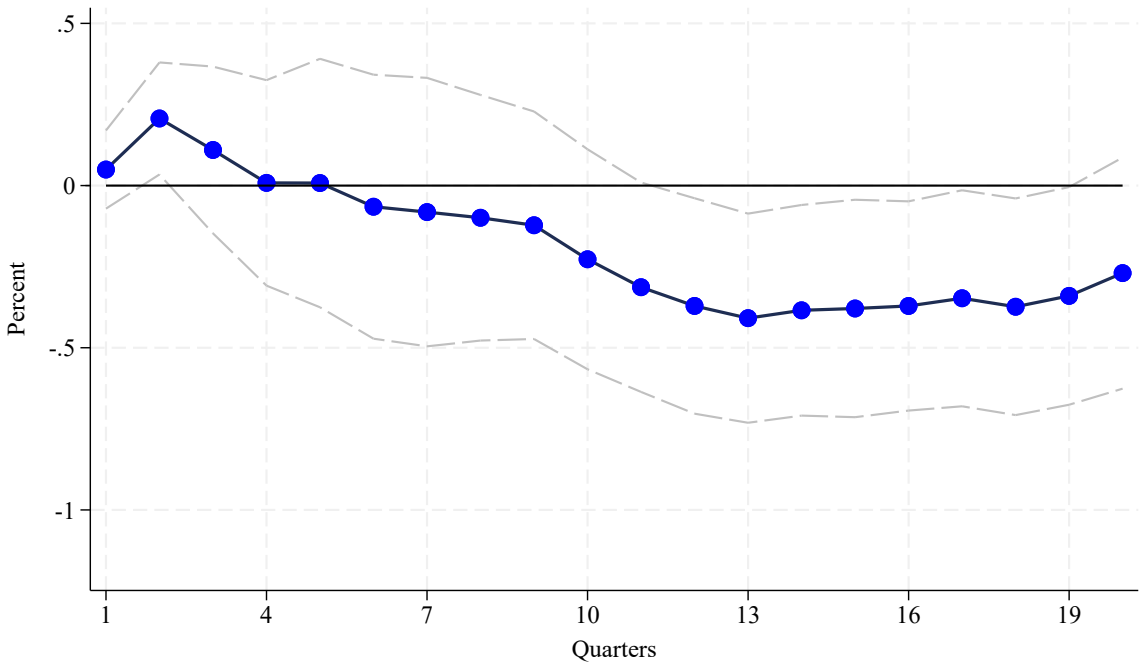
The regression is conducted for t quarters and i firms. The dependent variable y is the investment ratio which is the ratio of CAPEX over property plants and equipment. The only control if R_{t-1} which controls for past monetary policy. $sent_{i,t}$ is either monetary policy sentiment or monetary policy uncertainty. The indicator functions indicates that we allow for heterogeneity between firms in terms of beliefs. Since the sentiment sample is only available from 2001Q1 but the Bauer and Swanson (2022) surprises are available from 1991, I divide firms into high and low sentiment (uncertainty) based on the observations of the last part of the sample. Time and sector-time fixed effect are not introduced. This means that we are interested into aggregate impacts on the economy, with general equilibrium effects. Firm fixed effects γ_i are nonetheless included to interpret the coefficients as within effects. On top

[3]Both are introduced in the VAR to make sure to control for all proxies of stress on the bond market. Cloyne et al. (2023) uses the GZ spread while Gertler and Karadi (2015) in their original paper prefer the External Bond Premium. Our monetary policy shocks are thus not impacted by the choice of the credit spread proxy

of this, I control for seasonality with quarterly dummies. Standard errors are clustered at the firm-time level, as is common in LPs.

7.2 Firm evidence

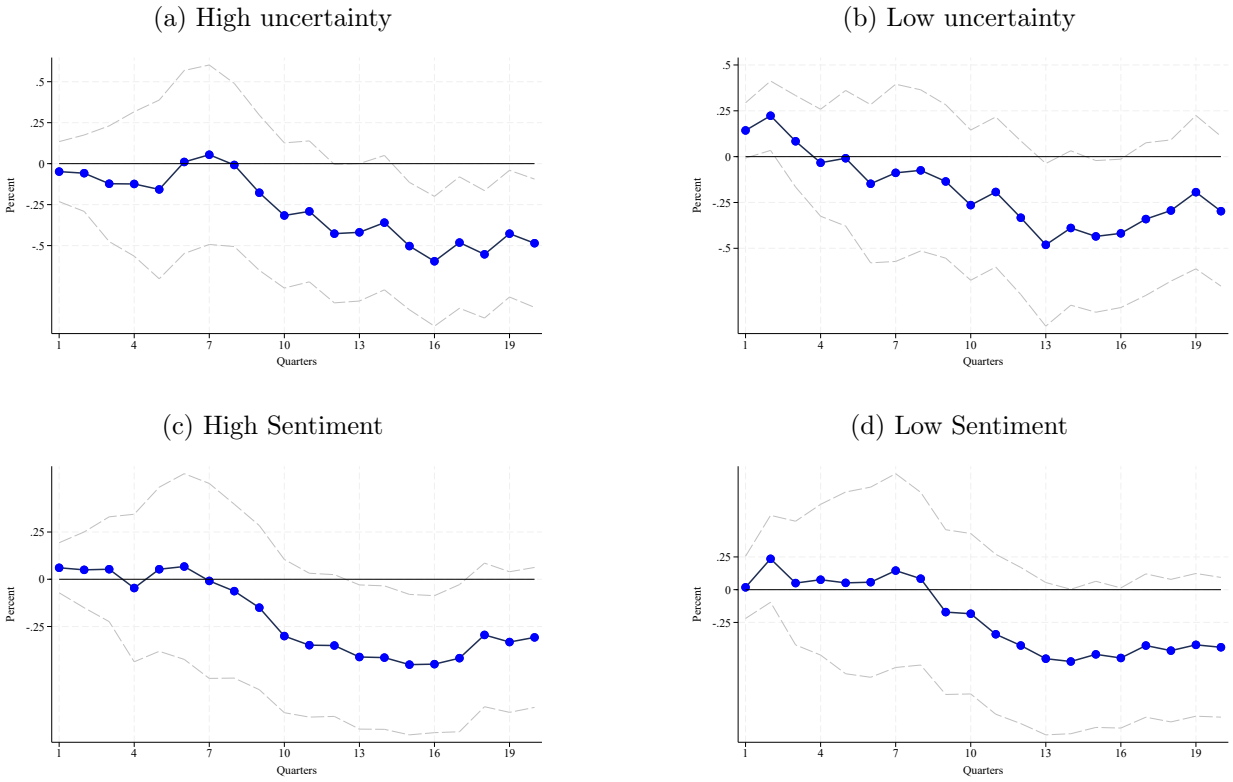
Figure 11: Investment ratio and Monetary policy shocks - average effect



The firgure shows the average impact of monetary policy shocks on firms' investment ratio in the sample following a 25bs increase in the one year interest rate. This effect is a point of reference when exploring the firm heterogeneity in the sample. This is also a sense check to make sure that the dynamics of investment following monetary policy decisions is in line with the literature. The sample runs from 1986 until 2023. The dynamics of the response is broadly in line with Cloyne et al. (2023): investment increases on impact and then starts falling after the first year, and the effect only becomes significant after the second year. Adding the last 7 years lowers the strength of the impact however. While Cloyne et al. (2023) report an impact of -0.5 pp, the impact here is half that number and stands around -0.25 pp. Next, I go one step further and estimate the differentiated impact of monetary

policy shocks on firms perceiving high and low monetary policy uncertainty.

Figure 12: Investment ratio and Monetary policy shocks



This figure presents local projections a la Jordà (2005). Across the specification, we regress the investment ratio up to 20 quarters ahead after an increase in the monetary shock of 25 bs as described in equation (6). A firm is classified as high uncertainty (sentiment) if its average perceived monetary policy risk over the last 20 years is above the sample median. The impulse response functions show the reaction with 90% confidence bands. Standard errors are clustered at the bank-quarter level.

Figure 12 shows that the firms' perception of monetary policy uncertainty matters for the transmission of monetary policy. Firms who, on average, perceive, high level of monetary policy uncertainty tend to react more and over a longer period to monetary policy shocks. Firms perceiving low uncertainty first increase their investment ratio and then drop their investment roughly around 3 years. This drop is nonetheless short-lived since investment picks up again from the fourth year onwards. In contrast, firm perceiving high monetary policy uncertainty see their investment falling on impact. Despite a small rebound at the end of the second year, their investment falls significantly until the fifth year. The coefficient of

high uncertainty firms seems to be aligned with the reaction of -0,5 pp found in the literature (Cloyne et al., 2023). The evidence thus suggests that firms that perceive high monetary policy uncertainty have reasons to fear that the conduct of monetary policy will have a negative effect on their investment dynamics. The evidence on monetary policy draws a different pictures. Firms expressing high monetary policy sentiment are actually more affected by it compared to their counterpart. This might indicates some evidence of exuberance in the tone of these firms' managers. Panel (c) shows that this exuberance is temporary since their investment ratio recovers after four years. The dynamics is thus more pronounced for firms with high uncertainty because their investment remains subdued beyond that time-frame. This section has shown that monetary policy sentiment and uncertainty matters for the transmission of monetary policy. Firms who perceive more monetary policy uncertainty see their beliefs confirms with a low investment ratio in the long-run while firms that are more positive about monetary policy are systematically more impacted by its conduct.

8 Conclusion

In conclusion, the analysis presented in this study sheds light on the impact of monetary policy uncertainty and sentiment on economic activity, with a sample of both firms and banks earnings' calls. The analysis first reveals that monetary policy attention is at an all-time high. Firms have never paid more attention to monetary policy and banks are mentioning interest rates more than ever. While firms pay attention to monetary policy when they are leveraged and have a low interest coverage ratio, banks' attention to monetary policy is closely related to the macro-economic environment. Furthermore, firms and banks mention monetary policy in different times. Firms speak about monetary policy in periods of high inflation and employment, that is, when monetary policy is expected to react whereas banks' attention is high when interest rates are high.

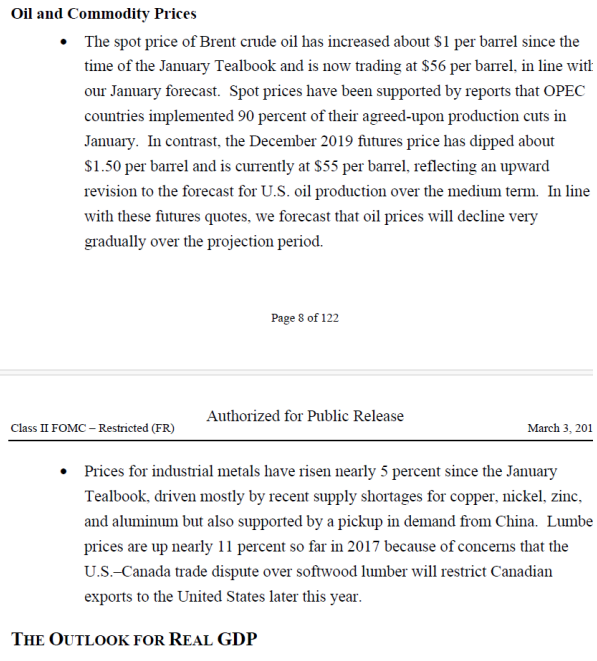
Our findings underscore the delayed yet pronounced impact of monetary policy uncertainty on economic activity. The paper finds that monetary policy uncertainty in the banking sector leads to a surge in the credit spread for firms. This has important implications for macro-economic activity. Industrial production falls in the first two years following the monetary policy uncertainty shock. The fall in economic activity then does not have negative implications for the banking sector: banks' return on assets and provisions are not impacted by monetary policy uncertainty shocks. Monetary policy uncertainty in the banking sector thus has a direct effect on the economy but does not impact morosity in the banking sector. The impact of monetary policy sentiment is coherent with bank-level regressions. After a shock in monetary policy sentiment, economic activity expands and the credit spread decreases. Banks are also expanding credit following the positive monetary policy sentiment shock. The positive sentiment is confirmed by the data since the expansion of production does not increase the amount of problem loans and necessary provisioning decreases. The findings thus support the idea the monetary policy sentiment and uncertainty have different transmission mechanism in the economy: uncertainty has an impact on the price of credit whereas sentiment influences both the price and quantity of credit.

The paper argues that firm monetary policy sentiment and uncertainty has a differentiated impact whether we look at the time dynamic or the cross-section. Introduction the aggregate index into a SVAR shows that aggregate monetary policy sentiment and uncertainty in the private sector does not have an impact on the economy. This results hides strong heterogeneity in the cross section. Indeed, firms with a high average monetary policy sentiment and uncertainty behave differently than their counterpart after a monetary policy shock. On the one hard, high perceived monetary policy uncertainty leads to a larger drop in investment ratio in the long-run. On the other hand, firms with high sentiment are eventually discredited and see a stronger fall in investment ratio than their peers. The paper thus argues that monetary policy uncertainty and sentiment can have important implications

for the transmission of monetary policy shocks to the economy further stressing the role of monetary policy communication in the monetary policy toolkit.

9 Appendix

9.1 Appendix A.1: Example of Tealbooks



Oil and Commodity Prices

- The spot price of Brent crude oil has increased about $1 per barrel since the time of the January Tealbook and is now trading at $56 per barrel, in line with our January forecast. Spot prices have been supported by reports that OPEC countries implemented 90 percent of their agreed-upon production cuts in January. In contrast, the December 2019 futures price has dipped about $1.50 per barrel and is currently at $55 per barrel, reflecting an upward revision to the forecast for U.S. oil production over the medium term. In line with these futures quotes, we forecast that oil prices will decline very gradually over the projection period.

Page 8 of 122

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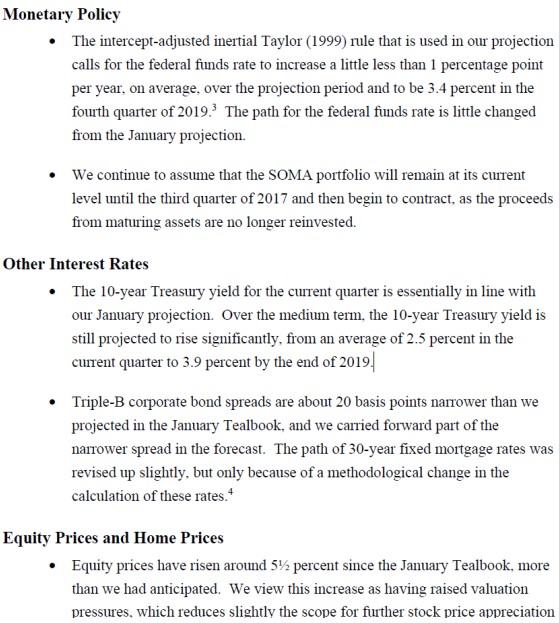
Class II FOMC – Restricted (FR) March 3, 201

- Prices for industrial metals have risen nearly 5 percent since the January Tealbook, driven mostly by recent supply shortages for copper, nickel, zinc, and aluminum but also supported by a pickup in demand from China. Lumbe prices are up nearly 11 percent so far in 2017 because of concerns that the U.S.–Canada trade dispute over softwood lumber will restrict Canadian exports to the United States later this year.

THE OUTLOOK FOR REAL GDP

After rising at an annual rate of about 2 percent in the fourth quarter of last year,

Figure 13: Economic growth Sections



Monetary Policy

- The intercept-adjusted inertial Taylor (1999) rule that is used in our projection calls for the federal funds rate to increase a little less than 1 percentage point per year, on average, over the projection period and to be 3.4 percent in the fourth quarter of 2019.[3] The path for the federal funds rate is little changed from the January projection.

- We continue to assume that the SOMA portfolio will remain at its current level until the third quarter of 2017 and then begin to contract, as the proceeds from maturing assets are no longer reinvested.

Other Interest Rates

- The 10-year Treasury yield for the current quarter is essentially in line with our January projection. Over the medium term, the 10-year Treasury yield is still projected to rise significantly, from an average of 2.5 percent in the current quarter to 3.9 percent by the end of 2019.

- Triple-B corporate bond spreads are about 20 basis points narrower than we projected in the January Tealbook, and we carried forward part of the narrower spread in the forecast. The path of 30-year fixed mortgage rates was revised up slightly, but only because of a methodological change in the calculation of these rates.[4]

Equity Prices and Home Prices

- Equity prices have risen around 5½ percent since the January Tealbook, more than we had anticipated. We view this increase as having raised valuation pressures, which reduces slightly the scope for further stock price appreciation

Figure 14: Monetary Policy Sections

9.2 Appendix A.2: Monetary policy dictionary

Table 5: List of monetary policy titles in Tealbooks A

Title
monetary policy
key background factors monetary policy
policy expectations and treasury yields
securities financing
special questions on the financing of cmbs and clos
special questions on long term changes in standards
treasury yields and policy expectations
special questions on the funding of high yield corporate bonds
special questions on the total return swaps referencing
financial institutions and short term funding markets
short term funding markets
special questions on market funding and liquidity
short term dollar funding markets and financial institutions
treasury and agency mbs market functioning
short term funding markets and financial institutions
treasury yields
treasury and agency finance and market functioning
treasury and other benchmark yields and policy expectations
policy expectations and treasury and agency mbs yields
policy expectations and asset prices
treasury and agency finance and short term funding markets
short term funding markets and year end dynamics
federal reserve operations and market functioning
short term funding markets and federal reserve operations
federal reserve operations and short term funding markets
federal reserve operations and short term funding marketsf
policy expectations and asset market developments
and federal reserve operations

Table 6: List of monetary policy words

money market	employment report	overnight index	issuance purchase
term premium	yield right	spread year	corporate bond
fund future	survey respondent	primary dealer	tips measure
security semiannual	premium basis	respondent percent	par security
bond spread	swap rate	maturity security	smoothed yield
financing rate	debt ceiling	policy expectation	swap quote
investment grade	target federal	market measure	yield notional
security yield	reverse repurchase	demand funding	term funding
valuation window	dollar funding	movement year	bond yield
repo rate	federal fund	source staff	straight read
source percent	path year	market participant	market stable
effective federal	distribution federal	repurchase agreement	curve smoothed
minute interval	curve indexation	financial market	fund rate
comparable maturity	agreement source	yield curve	market rate
future contract	curve run	nominal yield	policy rule
dollar percent	coupon security	run coupon	survey primary
future rate	dealer survey	policy path	interest rate
policy rate	yield source	market quote	intraday standard
commercial paper	data release	market expectation	notional par
window period	dealer market	yield basis	term rate
staff estimate	financial institution	market fund	funding market
yield period	note overnight	term yield	term security
path federal	yield investment	coupon source	downward revision
semiannual coupon	index percent	index swap	target range
monetary policy	forward rate	speculative grade	grade corporate
smoothed nominal	nominal security	deviation basis	liquidity functioning
debt limit	purchase program	risk premium	security basis
intermeeting period	term interest	dollar roll	central bank
general collateral			
Federal Reserve	Open Market	Alan Greenspan	Central Bank
The Fed	Quantitative Easing	Janet Yellen	Interest Rates
Money Supply	Monetary Policy	Jerome Powell	Fed Chairman
Fed Funds	Overnight Lending	Jay Powell	Fed Chair
Ben Bernanke	Central Bank	Last Resort	Discount Window
European Central	The ECB	Bank England	Bank Japan
The BOJ	Bank China	The Bundesbank	Bank France
Bank Italy			

Table 7: Sectoral Composition earnings calls

NAICS Sector Name	**Count**
Accommodation and Food Services	4,463
Administrative and Support and Waste Management	3,961
Agriculture, Forestry, Fishing and Hunting	538
Arts, Entertainment, and Recreation	1,430
Construction	3,115
Educational Services	195
Finance and Insurance	3,768
Health Care and Social Assistance	5,071
Information	21,368
Manufacturing	69,456
Mining, Quarrying, and Oil and Gas Extraction	10,720
Other Services (except Public Administration)	1,461
Professional, Scientific, and Technical Services	12,695
Public Administration	1
Real Estate and Rental and Leasing	12,561
Retail Trade	12,279
Transportation and Warehousing	5,418
Utilities	5,641
Wholesale Trade	5,541
nan	1,776

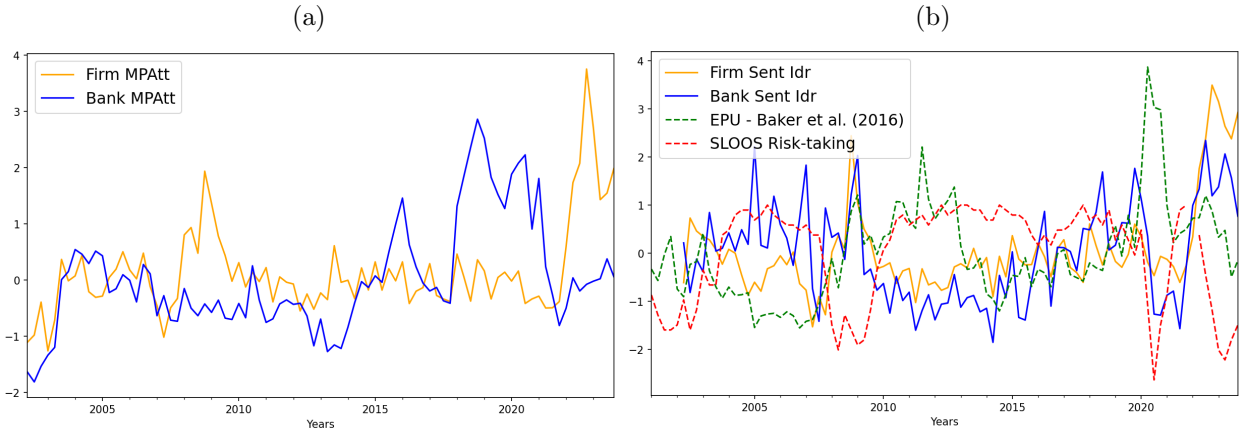
9.3 Appendix B: Sectoral Composition

Table 8: Counts of Monetary Policy bi-grams by NAICS Sector Names

NAICS Sector Name	Mon Pol count
Accommodation and Food Services	725
Administrative and Support and Waste Mgmt.	713
Agriculture, Forestry, Fishing and Hunting	109
Arts, Entertainment, and Recreation	275
Construction	710
Educational Services	12
Finance and Insurance	1,705
Health Care and Social Assistance	779
Information	2,317
Manufacturing	8,301
Mining, Quarrying, and Oil and Gas Extraction	1,115
Other Services (except Public Administration)	316
Professional, Scientific, and Technical Services	1,460
Public Administration	0
Real Estate and Rental and Leasing	5,857
Retail Trade	1,540
Transportation and Warehousing	1,001
Utilities	1,365
Wholesale Trade	805

9.4 Appendix C: Average Attention and Ambiguity across time

Figure 15: Monetary Policy Sentiment across time



This figure presents the sample average of $SentIdr$ (the interdecile range in sentiment) and attention to monetary policy at the quarterly frequency. All the variables are standardized.

9.5 Appendix D: Firm Fundamentals

	N	Mean	SD	p25	p50	p75
$\text{MPSent}_{f,t}$	318914	0.000	0.000	0.000	0.000	0.000
$\text{MPAtt}_{f,t}$	318914	0.301	1.044	0.000	0.000	0.000
$\text{MPUn}_{f,t}$	318914	0.000	0.000	0.000	0.000	0.000
$\log(\text{TA}_{f,t})$	222152	20.033	2.262	18.578	20.177	21.583
$\text{Cur Assets}_{f,t}$	217798	0.479	0.253	0.276	0.471	0.677
$\Delta Sales_{f,t}$	177782	0.699	3.111	-0.320	-0.000	0.479
$\text{ROA}_{f,t}$	158527	0.014	0.067	0.003	0.024	0.043
$\text{Lev}_{f,t}$	192726	0.299	0.291	0.097	0.245	0.409
$\text{IC ratio}_{f,t}$	162138	8.279	29.577	-0.558	2.678	10.091
$\text{Federal Fund rate}_t$	153153	1.530	1.648	0.250	0.750	2.250
$\text{inflation}_t(QoQ)$	153153	0.578	0.431	0.349	0.514	0.708
$\text{GDP growth}_t(QoQ)$	153153	0.514	1.348	0.301	0.595	0.872
$\log(\text{SP500})_t$	153153	7.472	0.474	7.085	7.326	7.836
$\log(\text{emp}_t$	153153	11.895	0.046	11.852	11.890	11.935
CEO conf_t	153153	52.649	12.619	43.000	55.000	62.000
EPU_t	153153	127.885	42.162	97.604	122.445	155.159
$\text{Jiang et al.(2020)}_t$	109360	0.050	0.831	-0.440	0.198	0.728

Table 9: Descriptive statistics Firms.

9.6 Appendix E: Bank Fundamentals

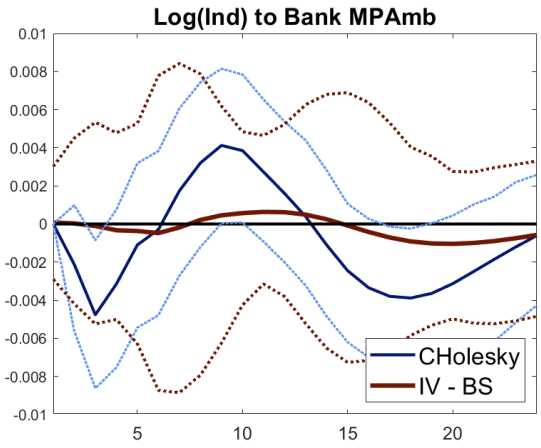
	N	Mean	SD	p25	p50	p75
Monetary Policy bi-grams Count$_{b,t}$	9193	0.622	0.529	0.000	1.000	1.000
Monpol-Sent$_{b,t}$	5514	0.516	1.789	-0.435	0.309	1.466
log(Size)$_{b,t}$	8599	15.828	1.609	14.749	15.566	16.504
Equity-to-assets$_{b,t}$	8598	10.996	3.403	9.054	10.692	12.522
Deposit-to-assets$_{b,t}$	8589	73.967	13.115	70.611	76.923	81.424
Problem loans$_{b,t}$	8129	1.576	2.003	0.486	0.923	1.829
loans$_t o_a sset$	8590	67.505	12.570	62.086	69.376	75.473
Loan loss provisions$_{b,t}$	8499	0.155	0.346	0.022	0.060	0.150
Cost-to-incomes$_{b,t}$	8408	63.087	20.790	54.855	61.364	67.812
Stock return$_{b,t}$	8283	0.001	0.221	-0.077	0.012	0.098
Federal Fund rate$_t$	9193	1.330	1.455	0.250	0.500	2.000
inflation$_t(QoQ)$	9193	0.503	0.340	0.316	0.496	0.680
GDP growth$_t(QoQ)$	9193	0.514	1.571	0.321	0.595	0.900
log(SP500)$_t$	9193	7.458	0.425	7.092	7.387	7.812
employment$_t$	9193	146505.407	6353.926	140428.000	145926.000	151698.000

Table 10: Descriptive statistics Banks

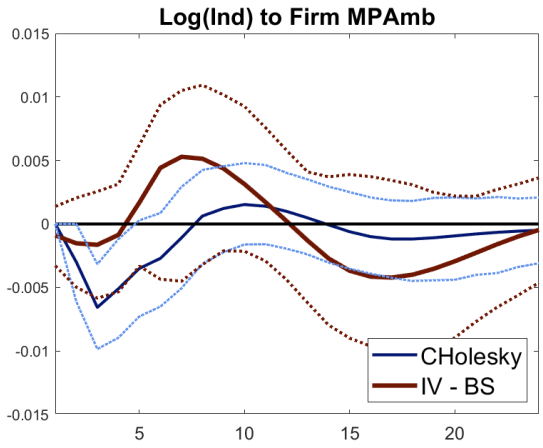
9.7 Appendix F: VAR with Ambiguity

Figure 16: Ambiguity and economic activity: Impulse Response Function

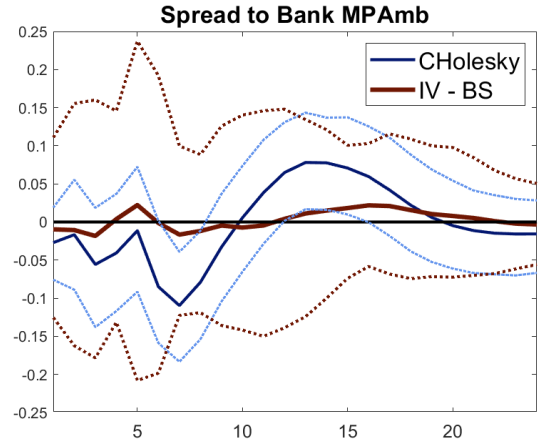
(a)



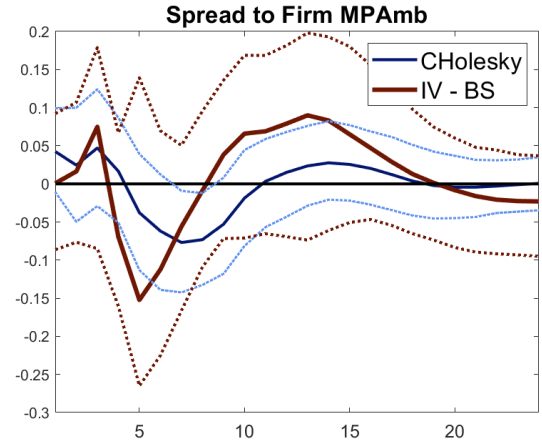
(b)



(c)

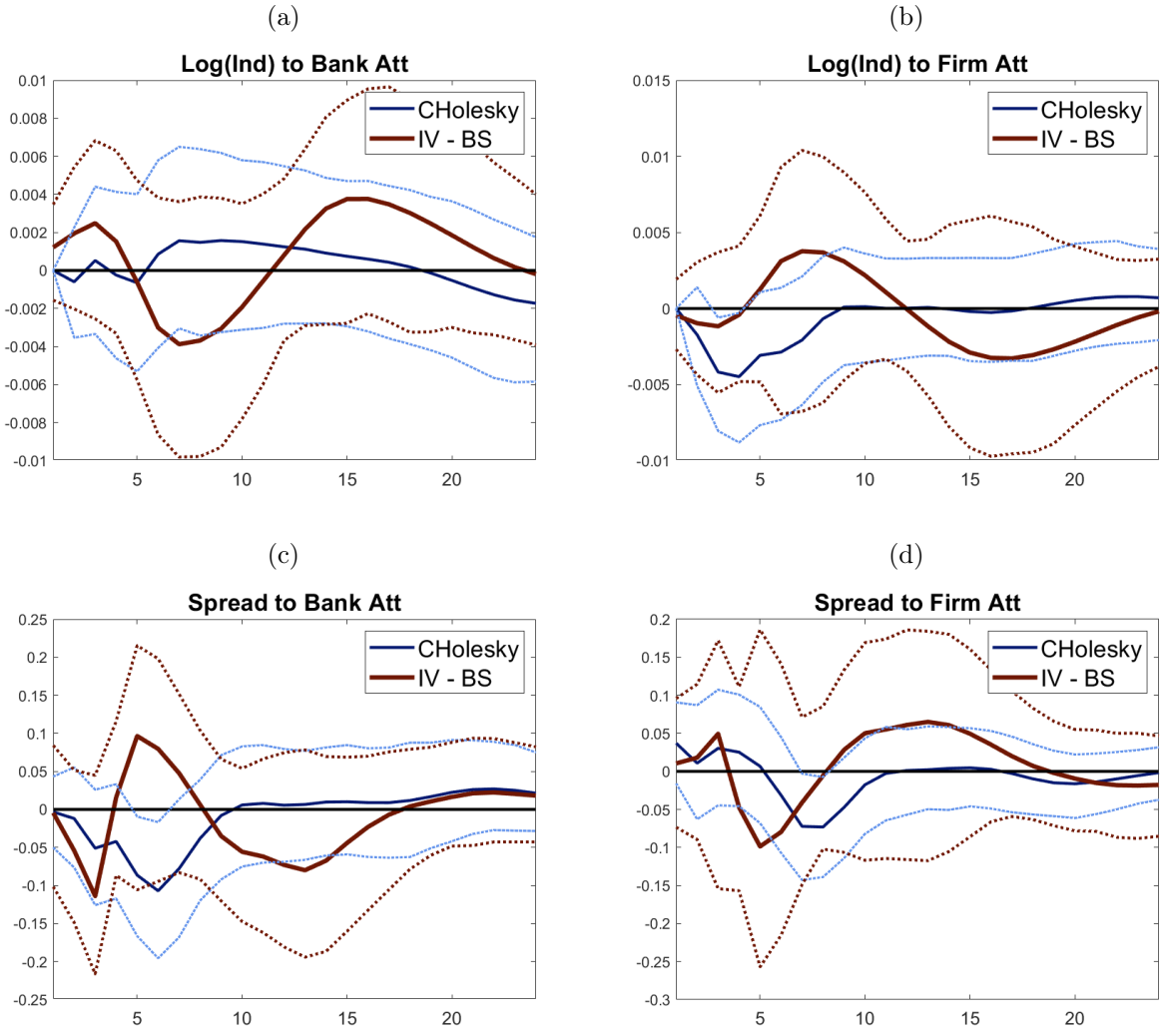


(d)



9.8 Appendix G: VAR with Attention

Figure 17: Uncertainty and economic activity: Impulse Response Function



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